

STATE OF CALIFORNIA
Budget Change Proposal - Cover Sheet
DF-46 (REV 08/17)

Fiscal Year 2018-19	Business Unit 5225	Department California Department of Corrections and Rehabilitation	Priority No. 5
Budget Request Name 5225-176-BCP-2018-GB		Program 4500 – Corrections and Rehabilitation Administration	Subprogram 4500039 – Information Technology

Budget Request Description
Radio Communications

Budget Request Summary

The California Department of Corrections and Rehabilitation requests \$32.9 million General Fund in 2018-19 to replace public safety radio system infrastructure and subscriber equipment at nine institutions, two juvenile justice facilities, and fire camps, and add interoperability to the transportation unit.

Requires Legislation <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Code Section(s) to be Added/Amended/Repealed	
Does this BCP contain information technology (IT) components? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If yes, departmental Chief Information Officer must sign.</i>	Department CIO	Date

For IT requests, specify the project number, the most recent project approval document (FSR, SPR, S1BA, S2AA, S3SD, S4PRA), and the approval date.

Project No. Project Approval Document: Approval Date:

If proposal affects another department, does other department concur with proposal? ☐ Yes ☐ No
Attach comments of affected department, signed and dated by the department director or designee.

Prepared By Al Castillo	Date	Reviewed By Jason Lopez	Date
Department Director Russell J Nichols	Date	Agency Secretary Scott Kernan	Date

Department of Finance Use Only

Additional Review: ☐ Capital Outlay ☐ ITCU ☐ FSCU ☐ OSAE ☐ CALSTARS ☐ Dept. of Technology

PPBA	Original Signed By: Madelynn McClain	Date submitted to the Legislature <i>1/10/18</i>
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BCP Fiscal Detail Sheet

BCP Title: Radio Communications

BR Name: 5225-176-BCP-2018-GB

Budget Request Summary

	FY18					
	CY	BY	BY+1	BY+2	BY+3	BY+4
Operating Expenses and Equipment						
5368 - Non-Capital Asset Purchases - Equipment	0	32,874	0	0	0	0
Total Operating Expenses and Equipment	\$0	\$32,874	\$0	\$0	\$0	\$0
Total Budget Request	\$0	\$32,874	\$0	\$0	\$0	\$0

Fund Summary

Fund Source - State Operations						
0001 - General Fund	0	32,874	0	0	0	0
Total State Operations Expenditures	\$0	\$32,874	\$0	\$0	\$0	\$0
Total All Funds	\$0	\$32,874	\$0	\$0	\$0	\$0

Program Summary

Program Funding						
4500039 - Information Technology	0	32,874	0	0	0	0
Total All Programs	\$0	\$32,874	\$0	\$0	\$0	\$0

Analysis of Problem

A. Budget Request Summary

The California Department of Corrections and Rehabilitation (CDCR) requests \$32.9 million General Fund in 2018-19 to replace public safety radio system infrastructure and subscriber equipment at nine institutions, two juvenile justice facilities, and fire camps, and add interoperability to the transportation unit.

B. Background/History

CDCR implemented and began using trunked radio communication systems in the late 1980s. Radio systems are a critical component of CDCR's core mission, as they are used in daily operation and to communicate during emergency situations. CDCR's radio systems currently serve adult institutions, juvenile justice facilities, fire camps, the peace officer academy, parole, transportation, internal affairs, and safety units, supporting over 20,000 subscribers.

The California Governor's Office of Emergency Services (CalOES), Public Safety Communications is responsible for the oversight and maintenance of state public safety radio systems. According to CalOES and the Federal Communications Commission, the lifecycle of the radio system infrastructure is approximately 10 years. Given that CDCR's radio systems are over 30 years old, they are unquestionably antiquated, overtaxed, and unreliable. Furthermore, the aging radio communications systems are no longer supported by the original equipment manufacturers or secondary markets.

Radio systems operating above maximum capacity pose a great risk to officers and staff requesting assistance. A report conducted by CalOES in 2010 (Attachment A) revealed that a majority of CDCR's adult institution radio systems have exceeded their capacity, with one radio system operating at over 225 percent of the traffic loading maximum capacity.

In July 2009, the California Department of Technology hired the consulting firm Gartner Group to complete a ten-year strategic plan for all state public safety agencies that participated in the Public Safety Radio Strategic Planning Committee. The results (Attachment B) showed that CDCR is ranked highest among public safety agencies for significant deficiencies based on the gap between technical capabilities and operations/interoperability capabilities, with the immediate risks impacting staff and public safety.

CDCR replaced 2 radio systems as part of the RJ Donovan and Mule Creek infill projects, and 24 radio systems using existing resources, for a total of 26 radio systems. However, these resources are not likely to be available in future years and the remaining outdated department-wide systems continue to frequently break down and are in eminent risk of extended or catastrophic failure.

Resource History
(Dollars in millions)

Program Budget	PY - 4	PY - 3	PY - 2	PY - 1	PY	CY
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Actual Expenditures for Radio Replacement	\$10.9	\$12	\$29	\$.4	\$6.9	\$7.2

Analysis of Problem

Workload History

Workload Measure	PY - 4	PY - 3	PY - 2	PY - 1	PY	CY
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Develop statewide radio communications contract	Develop operational & technical requirements	Complete				
Select and award vendor to supply equipment per communications contract		Complete				
Perform compliance testing on contracted equipment			Complete			
Build core infrastructure at data center			Complete			
Implement new radio systems at adult institutions with highest critical need		2 radio systems implemented		17 radio systems implemented	3 radio systems implemented	4 radio systems implemented

C. State Level Considerations

This proposal is consistent with commitments by the Governor's Office and the California Department of Technology to improve internal and external services and to enable radio interoperability with allied agencies for the Transportation Unit.

In 2010, the state released the California Public Safety Communications Project Strategic Recommendations. Based on their findings, it proposed the state link disparate state systems into a System of Systems with dedicated hardware to connect incompatible systems together and available state licensed/sponsored frequencies into a single system to improve operability and interoperability. Currently, CalOES is developing a plan to address the need for a statewide radio system for multiagency use. This proposal is consistent with this plan, and CalOES has provided their support for CDCR's radio replacement project (Attachment C).

Migrating to Project 25 digital standards will allow the Department to be in alignment with the Public Safety Communications Act of 2002 (Government Code, section 8592) to improve existing radio systems.

D. Justification

CDCR proposes to replace public safety radio system infrastructure and subscriber equipment at nine institutions, two juvenile justice facilities, and fire camps, and add interoperability to the transportation unit.

Catastrophic Failure at Institutions

CDCR experienced over 86 major documented system failures (Attachment D, Table 1, Figure 1) within the past three years. CalOES has submitted numerous "warnings" to CDCR that due to age, the Department's radio equipment may not be repairable should a major outage occur. Furthermore, it creates strain on CalOES's resources to provide additional staff to repair, locate spare parts, or provide interim solutions.

On July 5, 2017, the California Correctional Center and High Desert State Prison experienced a catastrophic failure of their radio system requiring both institutions to modify and partially lock-down their respective institutions. Multiple efforts by CalOES technicians and engineers to replace major

Analysis of Problem

parts and subsystems failed to make the system operable. The institutions maintained the partial lock-down for approximately five days until a radio system could be assembled using old parts as an interim solution. CalOES notified CDCR that this interim radio system is also over 28 years old and can also fail at any time. As a result of the seriousness of the outage and security concerns, inmate visitations were cancelled at the institutions.

Increasing Equipment Failure

Considering the existing radio system and subscriber equipment no longer meets state or federal standards, and has not been supported by the manufacturer for over 18 years, it is in eminent risk of complete failure without the possibility of restoration, and is no longer compatible with county, state or federal government systems. In comparison to the California Highway Patrol and the California Department of Wildlife and Fire Safety, which operate a larger number of radio sites (Attachment D, Figure 2), CDCR made up over 84 percent of the 102 major radio failures from 2009 to 2012. The number of failures has steadily increased as the systems get older and outages are harder to resolve. Additionally, institutions continue to report additional minor radio system outages that have steadily and adversely impacted inmate programs and operations at institutions.

The portable, handheld radio is no longer suitable for operation in and out of the institutions without severely impacting or limiting regular daily operations. Radio coverage is integral for the safety of staff when working around the perimeter of the institution or when routinely transporting inmates between facilities or to an outside medical facility or court. According to CalOES surveys for the last three years, all efforts to repair and return 410 portable radios failed, and all 410 portable radios were deemed unserviceable (Attachment E). Over 2,460 portable radios have been surveyed over the last 18 years and the amount of unserviceable radios is increasing at an alarming rate. The majority of institutions have depleted their stock of spare radios and require sharing of radio equipment for communications support.

Transportation Unit Interoperability

The Transportation Unit lacks the approved compliant radio equipment to properly perform their duties while transporting inmates statewide. Once a transportation vehicle leaves an institution only interoperable radio systems would ensure they can communicate with other first responders in areas of the state with no cell coverage. In general, the public is very hesitant to assist CDCR when vehicles are broken down in remote areas of the state and correctional staff must rely on other public safety responders which may not be available immediately. This scenario has been documented dozens of times and in all cases, it has increased the risk or potential for incidents such as fights between inmates, attacks on correctional officers, or possible escapes due to unscheduled stops.

Solutions

The proposed plan would result in all adult institutions, juvenile facilities, and fire camps being equipped with Project 25-compliant radio equipment. Project 25 is the standard for the digital design of operable and interoperable two-way wireless communication products for use by every level of government, including public safety officers and first responders. The statewide radio contract would reduce replacement and operating costs, and will minimize the Department's exposure to radio communication failure during routine, critical, or emergency response. Attachment A provides a side-by-side comparison of reduced radio traffic congestion as a result of increased system channel capacity at institutions that have received updated, Project 25-compliant equipment. CDCR anticipates this will be the case for the remaining institutions that are still using aging radio communication systems.

Furthermore, this proposed plan would result in the Transportation Unit being equipped with interoperability capabilities. Providing the Transportation Unit with interoperability will allow officers to communicate with other law enforcement entities and first responders that could assist, especially in remote locations, when a vehicle breaks down or there is an emergency during the transportation of an inmate, which would assist in avoiding further aggravation of the situation.

Analysis of Problem

E. Outcomes and Accountability

Approval of this request would allow CDCR to establish a cohesive, statewide radio system network for all users. Oversight of milestones will be reported to and monitored by CDCR's Information Technology Governance Committee.

This plan meets CDCR objectives and goals by addressing the aging infrastructure of CDCR's prisons by investing or replacing critical physical assets and improves efficiencies and reduces costs.

CDCR's Enterprise Information Services is creating a refresh plan to replace radio systems installed in 2012-13 and thereafter. The ongoing refresh will maintain the radio systems and subscriber units within the manufacturer product support lifecycle.

F. Analysis of All Feasible Alternatives

Alternative 1: Provide \$32.9 million General Fund in 2018-19 to replace public safety radio system infrastructure and subscriber equipment at nine institutions, two juvenile justice facilities, and fire camps, and add interoperability to the transportation unit.

Pros:

- Replaces antiquated radio equipment with new digital technology equipment that meets the operational and technical needs of CDCR.
- Addresses radio-related officer and public safety issues in every public safety program.
- Meets the state and federal requirements for Project 25-compliant systems.
- Advances emergency preparedness by providing staff the tools, equipment, and training to handle any emergent situation.
- Provides interoperability for the Transportation Unit at the state, local, and federal level.
- Implements a single radio system architecture that is more efficient and less costly to maintain.
- Ensures ongoing maintainability, continuous growth, and improvements over time.
- Reduces the ongoing and increasing expense of annual maintenance of the existing infrastructure and subscriber units.
- Offers the functionality to shut down a radio unit if it's lost, stolen, or falls into the possession of an inmate.

Cons:

- Creates additional General Fund expenditures.

Alternative 2: Provide \$18.6 million General Fund in 2018-19 to replace public safety radio system infrastructure and subscriber equipment at six institutions, two juvenile justice facilities, and fire camps, and add interoperability to the transportation unit.

Pros:

- Replaces antiquated radio equipment with new digital technology equipment that meets the operational and technical needs of CDCR.
- Addresses radio-related officer and public safety issues in every public safety program.
- Meets the state and federal requirements for Project 25-compliant systems.
- Advances emergency preparedness by providing staff the tools, equipment, and training to handle any emergent situation.
- Provides interoperability for the Transportation Unit at the state, local, and federal level.
- Implements a single radio system architecture that is more efficient and less costly to maintain.
- Ensures ongoing maintainability, continuous growth, and improvements over time.
- Reduces the ongoing and increasing expense of annual maintenance of the existing infrastructure and subscriber units.

Analysis of Problem

- Offers the functionality to shut down a radio unit if it's lost, stolen, or falls into the possession of an inmate.

Cons:

- Leaves adult institutions remaining with equipment failure issues and at risk of catastrophic failure.
- Creates additional General Fund expenditures.

Alternative 3: Provide \$48.5 million General Fund in 2018-19 to replace public safety radio system infrastructure and subscriber equipment at nine institutions, two juvenile justice facilities, and fire camps, add interoperability to the transportation unit, and provide a five-year equipment upgrade/refresh for institutions upgraded within the past 3 years.

Pros:

- Replaces antiquated radio equipment with new digital technology equipment that meets the operational and technical needs of CDCR.
- Addresses radio-related officer and public safety issues in every public safety program.
- Meets the state and federal requirements for Project 25-compliant systems.
- Advances emergency preparedness by providing staff the tools, equipment, and training to handle any emergent situation.
- Provides interoperability for the Transportation Unit at the state, local, and federal level.
- Implements a single radio system architecture that is more efficient and less costly to maintain.
- Ensures ongoing maintainability, continuous growth, and improvements over time.
- Reduces the ongoing and increasing expense of annual maintenance of the existing infrastructure and subscriber units.
- Offers the functionality to shut down a radio unit if it's lost, stolen, or falls into the possession of an inmate.

Cons:

- Provides a General Fund allocation for upgrade/refresh equipment prematurely without CDCR having a chance to develop a global upgrade/refresh plan.
- Creates additional General Fund expenditures.

G. Implementation Plan

The implementation of the project will occur in 2018-19.

H. Supplemental Information

To ensure the radio system meets all applicable county, state and federal mandates, the Department will leverage the existing statewide radio contract master agreement for radio infrastructure and subscriber equipment for the design, development and implementation. The statewide radio contract was awarded for use by state agencies for a total of 10 years and will provide product and service cost avoidance up to the final year of the project implementation. Additionally, the contract will provide product refresh opportunities and cost reduction when procuring in larger quantities.

To provide uninterrupted statewide communications the project will leverage the use of the Department's network, therefore Enterprise Information Services staff will be used for support and continual service at substantial cost avoidance. Over-the-air programming services will continue to be performed by the CDCR staff resulting in major cost savings to the Department throughout the entire project implementation.

I. Recommendation

Alternative 1: Provide \$32.9 million General Fund in 2018-19 to replace public safety radio system infrastructure and subscriber equipment at nine institutions, two juvenile justice facilities, and fire camps, and add interoperability to the transportation unit.

Traffic Load Study Report

To assess the reliability of their trunked radio system, CDCR requested for CalOES, PSCD, formerly OCIO-PSCD, to conduct a study on the traffic loading of the trunked radio system in each of the 33 CDCR institutions. Traffic loading data for the months of September 2009, October 2009, and November 2009 were analyzed. The table on page 2 of this report summarizes the results of this traffic load study.

Results

Nineteen (19) of the thirty-33 (33) sites were found to require at least one additional voice channel to carry the current traffic load. Wasco's traffic load for November 2009 suggests that two additional voice channels are required. Installing the additional voice channel(s) would provide a P 5 grade of service, which means that a call has a 95% chance of finding a vacant voice channel and a 5 % chance of being blocked.

Brief Description of Work Performed

The traffic data for September, October and November 2009 were analyzed. In a given hour, the load on the trunked system is expressed as the product of the number of call attempts and the average length of all call attempts. The busy hour load was determined by averaging the ten-high day busy hour for each month. The busy hour load is in call-seconds and is converted to Erlang units by dividing it by 3600. Because the traffic tables such as the Erlang B are indexed by grade of service, selecting a grade of service is the first step in a traffic study. It assumed a grade of service of P 5. By using the Erlang B table, grade of service of P 5 and the carried traffic, the number of voice channels required to carry the traffic can be determined.

Raw Data Manipulation

The traffic data is collected by the site controller in 15 minute increments for dispatched and telephone calls. The data for telephone calls were stripped off and only the data for dispatched calls were analyzed. Data collected are the average dispatch delay, number of dispatched calls, average dispatch length, and the number of dispatch busy.

The total dispatch length was calculated by multiplying the number of dispatch calls and the average dispatch length for each 15 minute increment. Each 15 minute data was then added to arrive at the total traffic for each hour of the day. The busiest hour load for each day were collected and compared to the other days of the month. The traffic load for the ten (10) busiest days of the month is averaged and converted to Erlang. The Erlang and a grade of service of 5% blockage are used to look up the number of voice channels required in the Erlang B Network Design table.

Table 1 - Traffic Loading Study Results (pages 3-4)

		Sep-09	Oct-09	Nov-09		
	loading capacity (minutes)	Average 10 Day Busiest hour Traffic (minutes)				
Site Name	# of voice channels installed	# of voice channels required (based on 5 calls blocked out of 100 calls) Erlang B Table			Average Traffic Loading	Recommendations
1 WSP	22.86 2	51.50 3	51.02 3	53.85 4	228.00 %	Add 2 voice channels
2 NKP	22.86 2	35.73 3	34.87 3	38.54 3	159.15 %	Add 1 voice channel
3 CRC	22.86 2	37.10 3	34.31 3	34.74 3	154.79 %	Add 1 voice channel
4 SQP	22.86 2	31.19 3	36.02 3	34.20 3	147.88 %	Add 1 voice channel
5 SCC	22.86 2	33.78 3	31.84 3	33.19 3	144.09 %	Add 1 voice channel
6 CMC	22.86 2	30.27 3	28.77 3	28.44 3	127.58 %	Add 1 voice channel
7 DVI	22.86 2	30.78 3	27.26 3	29.43 3	126.82 %	Add 1 voice channel
8 PVP	22.86 2	28.69 3	25.87 3	26.99 3	118.92 %	Add 1 voice channel
9 RJD	22.86 2	27.09 3	27.00 3	25.65 3	116.27 %	Add 1 voice channel
10 CCC/HDP	53.94 3	62.57 4	56.31 4	58.45 4	109.58 %	Add 1 voice channel
11 CAL	53.94 3	55.16 4	56.59 4	57.64 4	104.68 %	Add 1 voice channel
12 ASP	22.86 2	24.95 3	23.01 3	22.82 2	103.21 %	Add 1 voice channel
13 MCP	22.86 2	20.40 2	21.83 2	19.41 2	89.88 %	
14 CIM	53.94 3	48.06 3	41.66 3	43.84 3	82.54 %	
15 CMF/SOL	53.94 3	44.20 3	43.70 3	44.99 3	82.13 %	

		Sep-09	Oct-09	Nov-09			
		loading capacity (minutes)	Average 10 Day Busiest hour Traffic (minutes)				
Site Name		# of voice channels installed	# of voice channels required (based on 5 calls blocked out of 100 calls) Erlang B Table		Average Percent Loading	Recommendations	
16	COR	132.6 5	106.60 5	100.01 5	102.66 5	77.75 %	
17	CIW	22.86 2	18.84 2	17.07 2	17.19 2	77.42 %	
18	CWF/VSP	53.94 3	39.65 3	40.32 3	39.81 3	74.02 %	
19	CCI	53.94 3	37.98 3	35.96 3	41.79 3	71.52 %	
20	CTF/SVP	132.6 5	106.60 5	86.43 5	91.48 5	71.52 %	
21	CVP/ISP	91.44 4	56.02 4	53.91 3	52.11 3	59.07 %	
22	PBP	22.86 2	13.07 2	12.48 2	14.34 2	58.16 %	
23	SAC/FSP	91.44 4	52.18 3	51.58 3	52.34 3	56.90 %	
24	LSP	53.94 3	29.78 3	28.60 3	32.19 3	55.97 %	
25	CEN	53.94 3	29.81 3	28.51 3	27.22 3	52.86 %	
26	KVP	91.44 4	49.57 3	42.08 3	42.37 3	48.85 %	

California Department of Corrections and Rehabilitation (CDCR) Objectives and Roadmap Workshop

Prepared for



GARTNER CONSULTING

Engagement: 222670311

Version #1

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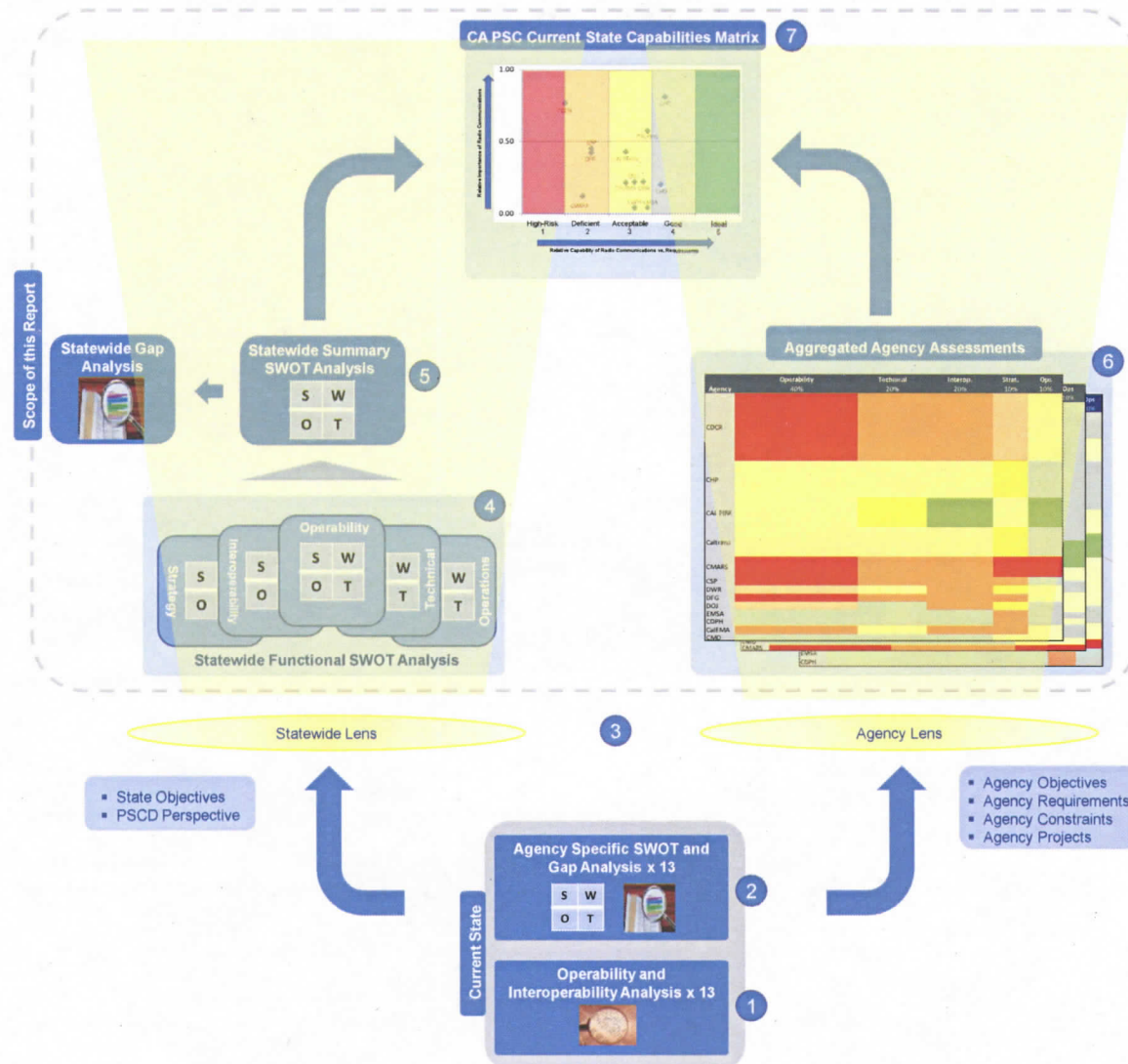
Gartner

Agenda

- Gartner Approach
- Agency Overview
- Agency and Statewide Rating
- Statewide Alternatives and Objectives
- CDCR Options and Objectives
- Next Steps

Gartner Approach

Analyzing the current state from two perspectives



CDCR Overview

- CDCR has four basic user groups:
 - Institutions and Institution Transportation units
 - Statewide Transportation unit
 - Parole (adult and juvenile), OCS and IA
 - CDCR Fire Camps
- CDCR has 36 separate institution systems; 35 are past their useful life
 - Thirteen (13) institutions have inhibitors that are no longer working and no replacement parts cannot be found; As a result, CDCR cannot turn off lost radios in these locations
- Statewide Transportation unit relies on CMARS or cell phones, neither of which are appropriate for the communications required
- Parole, OCS and IA units have limited radios or rely on cell phones
 - Parole has indicated unmet requirements for dedicated talk groups on trunked systems
- A BCS for institution systems replacement was recently submitted for internal consideration

CDCR Overview

SWOT Analysis

Strengths	Weaknesses
<ol style="list-style-type: none"> 1. Currently use appropriate band for propagation within institutions 2. The general design of institution systems is adequate for personnel 3. Have identified system deficiencies and are planning to issue RFI/RFPs for system replacements 4. Parole/OCS are leveraging local/regional systems (4 trunked systems; 1 talk group in Sacramento) 	<ol style="list-style-type: none"> 1. Almost all equipment is past its useful life and needs replacement 2. Replacement equipment is not available 3. Institution systems coverage is not acceptable and has degraded over time 4. Transportation coverage and monitoring are inadequate 5. Parole, OCS and IA units have inadequate coverage and channel monitoring 6. There are channel congestion issues in institutions and in some transportation sections. 7. Some units have more limited functionality than others 8. Disparate and "siloed" systems between institutions and non-institution programs causes limited interoperability 9. There is no centralized authority for radio decisions 10. Deficiency of MOUs with allied agencies 11. Lack of funding to support a defined refresh cycle for radio equipment and lack of consistent maintenance schedule of radio inventory and infrastructure 12. Lack of encryption, particularly for DAPO, OCS, IA and Transportation 13. Lack of dedicated personnel resources for operational support and training 14. Lack of individual talk groups and tactical channels 15. Process to purchase, deploy radios to new Parole, Internal Affairs and OCS agents is inadequate
Opportunities	Threats
<ol style="list-style-type: none"> 1. Upgrade current institution systems 2. Subscribing to other law enforcement systems would address personnel and public issues for non-institution units 3. Upgrading current non-institution system (CMARS) could provide adequate monitoring and coverage 4. Develop talk groups on local/regional systems 	<ol style="list-style-type: none"> 1. System-wide failure at an institution could cause significant down time which place personnel and public safety at risk 2. Encryption and other security features will be required due to public safety operational requirements 3. Additional legislation requiring Parole, OCS and IA to use local law enforcement agency radio systems that do not have adequate user capacity or capabilities

CDCR Overview

Gaps

Gap Category	Gap Description
Equipment Age	All but one institution system are past their recommended useful lifecycle and much of the infrastructure and end-user equipment is no longer supported by the original equipment manufacturer.
<p>These systems must be replaced in the near future. If equipment and infrastructure are not refreshed, personnel and public safety will be at risk. For example, DAPO – Region III has over 650+ portable radios that will need to be replaced in the very near future.</p>	
Coverage	Coverage outside institutions is inadequate and does not meet the public and personnel safety and security needs of the Department.
<p>Field units do not have a reliable, interconnected system with appropriate coverage for their needs. Field units can only communicate with other units that are within range of the local repeater. Several user groups use cell phones as a primary means of communication which is not accessible or reliable enough in parts of the State. CMARS (the current system) must be upgraded or the Department must build or find a new, appropriate system for these units. If coverage gaps are not filled, personnel, as well as the public safety will be at risk. Specifically for Parole, they are missing dedicated talk groups in certain areas on local/regional trunked systems.</p>	
Security	Institution and non-institution personnel do not have adequate access to backup and support personnel. Communications are not encrypted and can be intercepted by any capable radio.
<p>All units that work for CDCR require security, both in having immediate access to backup and support personnel anywhere in the State, as well as blocking access to the radio systems for unauthorized users. Currently, coverage, monitoring, and encryption are deficient through the Department's institution and field systems. This should be resolved both through replacement/upgrades of institution systems and upgrades/change of field system(s). If these deficiencies are not rectified, personnel, public safety, and institution security are unnecessarily at risk.</p>	

CDCR Overview

Capabilities Ratings


Capability	Rating	Rationale
Operability	2	CDCR institution systems have channel congestion issues. Non-institution users face significant coverage issues. All units have a need for encryption that is unmet.
Technical	1	35 of the 36 institution systems are beyond their expected useful life and are parts of the systems are already failing. Locating replacement parts for systems of this age has become extremely difficult and cannot be done via normal procurement methods. The failure of an institution radio system could endanger the lives of CDCR personnel, inmates and the public. Non-institution personnel have radios that are in need of refresh. Other units do not have radio or adequate quantities of radios.
Interoperability	2	Transportation Units are completely dependent on cell phones for communication with local entities or allied agencies. Non-institution units such as OCS, Parole and Internal Affairs are reliant of local partners for radio communications.
Strategy	3	The responsibility for system planning has historically been the responsibility of each institution or division. The lack of coordination has not allowed for the development of a Department-wide public safety communications strategy.
Operations	3	CDCR does not have a consistent schedule for maintenance of radios or infrastructure. The division of responsibilities between institutions and other divisions has resulted in a lack of consistent documentation and training.

5	No gaps or issues (Ideal)
4	Gaps impacting efficiency
3	Gaps impacting effectiveness
2	Gaps impacting personnel safety
1	Gaps impacting public safety

Statewide Agency Ratings

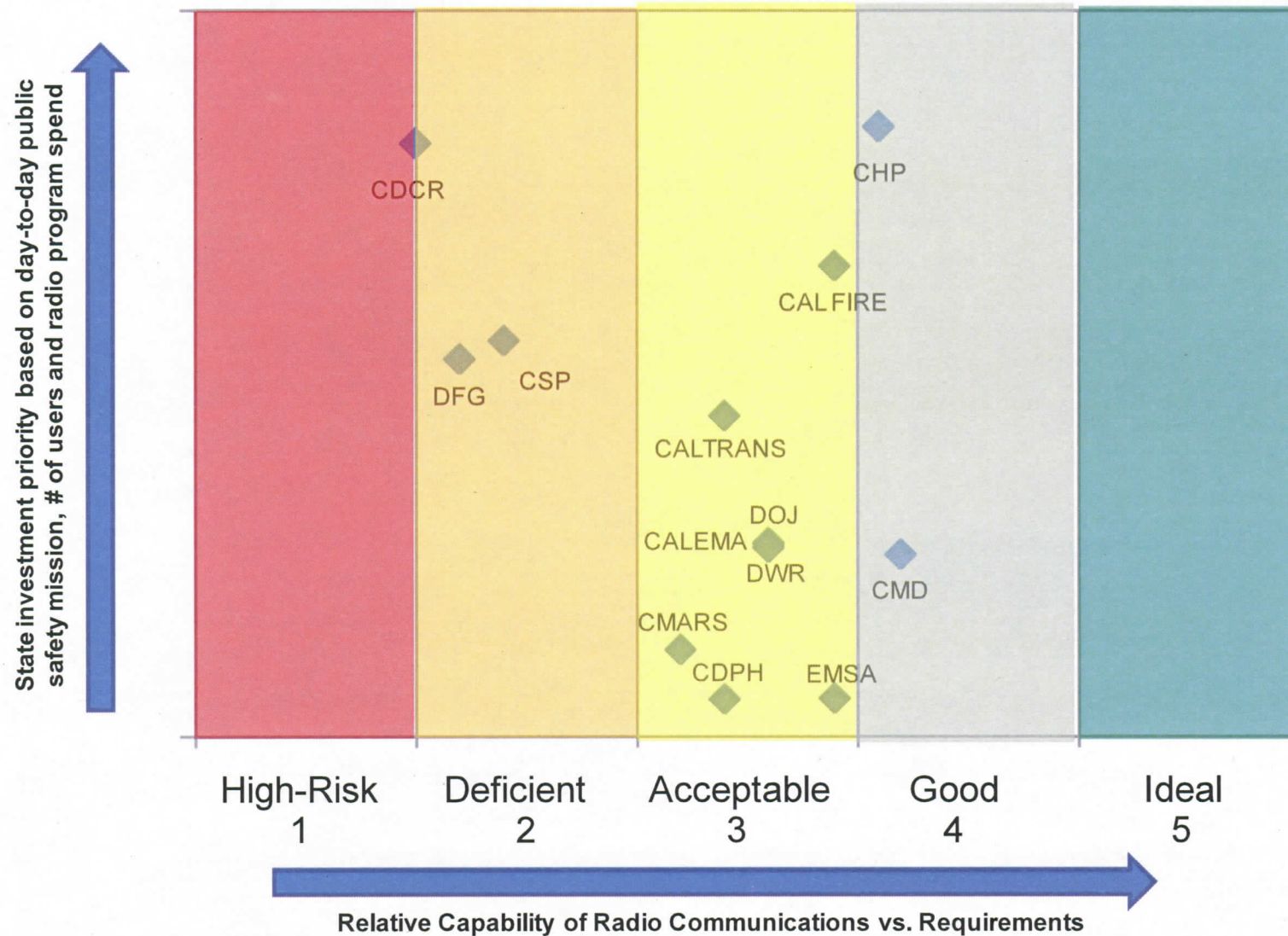
Agency	Operability	Technical	Interoperability	Strategy	Operations
CHP*	4	4	4	5	4
DFG	1	2	4	3	3
CSP	2	2	4	3	3
DOJ	3	5	3	4	4
CDCR	2	1	2	3	3
CAL FIRE	4	3	4	4	5
CalEMA	4	3	4	3	3
Caltrans	3	3	4	4	4
DWR	4	3	4	3	3
CMARS	3	3	4	3	3
EMSA	4	4	4	4	3
CDPH	3	4	4	3	3
CMD	5	4	4	3	3

5	No gaps or issues (Ideal)
4	Gaps impacting efficiency
3	Gaps impacting effectiveness
2	Gaps impacting personnel safety
1	Gaps impacting public safety

 "actively addressing gaps" means one of the following:
- Solutions have a defined plan and funding source

*CHP's ratings assume the completion of the CHPERs Project

Current State Capabilities Matrix



Statewide Alternatives and Objectives

State Alternatives

#	Alternative	Description
1	Stovepipe Evolution	<ul style="list-style-type: none"> Existing “stovepipe” systems continue to evolve along separate paths based on agency needs and funding, as constrained by enterprise standards and architecture guidelines
2	Single Consolidated Statewide System	<ul style="list-style-type: none"> Existing systems are replaced by a single Statewide shared, multi-agency, digital, trunked system (similar to Florida, Pennsylvania, Indiana and others; also similar to what was proposed by PRISM in 1997) Such a system would provide all agencies with Statewide radio coverage/capacity and would facilitate interoperability among State agencies
3	System of Systems	<ul style="list-style-type: none"> Use IP and standards-based Public Safety Communications gateway technologies to link separate legacy networks together to improve operability and inter-operability As legacy networks migrate to standards-based digital technologies, evolve the integration to enable infrastructure sharing (e.g. roaming) and more advanced interoperability Selectively consolidate aligned agency systems (and possibly those of willing larger agencies) into a shared, multi-agency digital trunked network. Coverage and capacity of this network would be based on the needs of the participating agencies
4	Public Private Partnership (PPP) Delivering a 700 MHz Statewide Broadband System	<ul style="list-style-type: none"> California wireless communications coordinators and political leaders work with the California congressional delegation, key players in the telecommunications industry and the FCC to develop rules under which a telecom PPP will subsidize the build out of a Statewide public safety broadband system in exchange for conditional use of 10 MHz of spectrum within California Most major State agencies would migrate to this system over time. Some State agencies may choose to maintain private systems or other capabilities based on business requirements not met by the new system

Stovepipe Evolution

- Existing stovepipe systems continue to evolve along separate paths based on agency needs and funding, as constrained by enterprise standards and architecture guidelines

Pros	Cons
<ul style="list-style-type: none">■ Agencies would continue to have solutions tailored for their individual operability requirements■ No process changes are required	<ul style="list-style-type: none">■ Several agencies would only make incremental improvements in capacity and coverage■ The discrepancy in radio capabilities between agencies will increase■ Some agencies are already under funded and may not evolve

Single, Consolidated Statewide System

- Existing systems are replaced by a single Statewide shared, multi-agency, digital , trunked system (similar to Florida, Pennsylvania, Indiana and others; also similar to what was proposed by PRISM in 1997)
- Most likely a dual band system: 700/800 MHz and VHF high
- Commercial data services (3G broadband via radio common carriers)

Pros	Cons
<ul style="list-style-type: none">■ Such a system would provide all agencies with Statewide radio coverage/capacity and would facilitate interoperability among State agencies■ Consolidated maintenance■ Easier MOUs with local and federal departments	<ul style="list-style-type: none">■ Significant upfront investment■ Requires agency agreements and strong executive support■ Requires process changes for all agencies

System of Systems (SoS)

- Use IP, VOIP and standards-based public safety communications gateway technologies to link separate legacy networks together to improve operability and interoperability
- As legacy networks migrate to standards-based digital technologies, evolve the integration to enable infrastructure sharing (e.g. roaming) and more advanced interoperability
- Selectively consolidate aligned agency systems (and possibly those of willing larger agencies) into a shared, multi-agency digital trunked network. Coverage and capacity of this network would be based on the needs of the participating agencies

Pros	Cons
<ul style="list-style-type: none">■ Alignment with Statewide direction outlined in the CalSCIP■ Improved interoperability with aligned partners within the SoS■ Could potentially expand the virtual coverage of existing systems■ Potentially fewer Statewide systems	<ul style="list-style-type: none">■ Moderate upfront Statewide investment to build out the necessary “backbone”■ Moderate upfront agency investments to participate in the System of Systems■ A number of MOUs would need to be established

Public Private Partnership (PPP) Delivering a 700 MHz Statewide Broadband System

- California public safety communications coordinators and political leaders work with the California congressional delegation, key players in the telecommunications industry and the FCC to develop rules under which a telecom PPP will subsidize the build out of a Statewide public safety broadband system in exchange for being awarded conditional use of 10 MHz of spectrum within California
- Most major State agencies would migrate to this system over time. Some State agencies may choose to maintain private systems or other capabilities based on business requirements not met by the new system

Pros	Cons
<ul style="list-style-type: none">■ Minimal upfront investment for the State■ Would address the Statewide wireless data requirements for the State■ Provides the State with a platform that will allow agencies to capitalize on the projected convergence of voice and data■ Provides some agencies with an immediate solution and gives other agencies the flexibility to remain on their system and eventually participate	<ul style="list-style-type: none">■ Significant hurdles to accomplish this alternative: FCC would have to grant the State an exemption and a business partner would need to agree that a business case exists to participate■ Agency would be reliant on third-party provider to build-out and support the infrastructure

Alternatives Analysis

		Requirements						Costs		Implementation		Risk	
#	Alt.	Coverage	Capacity	Data	Features	Interop.	Maintainability	One Time	Ongoing	Effort	Feasibility	Tech	Overall
1	Stove-pipe	2	2	3	4	2	2	5	2	5	5	5	2
2	Single System	5	4	3	4	4	4	2	4	2	2	4	3
3	SoS	4	3	3	4	4	3	4	3	3	4	3	3
4	PPP	5	5	5	5	5	5	3	5	4	2	2	4

2 Not adequate 3 Partially Adequate 4 Adequate 5 Exceeds

- The Stovepipe alternative (#1) is the cheapest alternative but fulfills the fewest requirements
- The Single System alternative (#2) meets several requirements, but requires a significant initial investment
- The SoS alternative (#3) meets several requirements and is attainable
- The PPP alternative (#4) received the highest rating because it fulfills most of the State's requirements, but there are several dependencies including working with the FCC to grant an exemption to California and finding a commercial partner to develop the system

Gartner recommends executing a System of Systems strategy and simultaneously working with the FCC to pursue the PPP alternative

Statewide Objectives

10 Year Objectives

	10 Year Objectives
Governance	<ul style="list-style-type: none"> ■ The OCIO will develop a Statewide strategic plan for the State and will actively work with the agencies to execute it ■ Agencies will have appropriate channels for providing their input and feedback into the Statewide strategic plan
Technology	<ul style="list-style-type: none"> ■ That State will reduce the number of agency-maintained stovepipe systems through consolidation and sharing ■ PSRSPC agencies will be standardized on P25 digital systems allowing them to access additional user features/spectral efficiency ■ Actively progress to 6.25 MHz capability (e.g. P25 Phase 2) as may be required by the FCC ■ The State Microwave Network and IP gateways to network together agency systems into a "System of Systems" that will enable interoperability among PSRSPC agencies and with external partners and could increase each agencies virtual coverage
Spectrum	<ul style="list-style-type: none"> ■ PSCD will perform proactive frequency planning
Data	<ul style="list-style-type: none"> ■ State agencies will be able to acquire mobile wireless data services from a defined State mobile wireless data contract
Operations, Training and Documentation	<ul style="list-style-type: none"> ■ PSCD is the State's shared services provider of public safety wireless communications services providing a full-range of services from strategic planning through operational support of equipment and radio sites ■ All agencies will have formalized and repeatable initial and ongoing training and user documentation (Field Operation Guides [FOGs] and Interoperability Field Operation Guides [IFOG]) ■ Cross-agency training will be conducted in a formal and regular fashion ■ Documentation for different disciplines will be established

Statewide Objectives

2-3 Year Activities

	2-3 Year Activities
Governance	<ul style="list-style-type: none"> ■ OCIO will have the responsibility for developing the public safety radio communications Statewide strategy ■ PSRSPC will have the responsibility to accept, reject or request revisions for the Statewide strategy
Technology	<ul style="list-style-type: none"> ■ Vault and tower ownership and management responsibility will be consolidated for the State under the OCIO-PSCD ■ The State Microwave System will be enhanced to accommodate the System of Systems ■ More State contracts for radio equipment and will be established to streamline the procurement process
Spectrum	<ul style="list-style-type: none"> ■ Interstitial frequencies created by narrowbanding will be applied for ■ The State's presence in national forums (e.g. APCO, NPSTC and IWCE) will be significantly enhanced
Data	<ul style="list-style-type: none"> ■ Current mobile wireless data contracts and solutions (such as CHPs) will be leveraged for Statewide usage if appropriate
Operations, Training and Documentation	<ul style="list-style-type: none"> ■ Improve PSCD accountability, efficiency and effectiveness ■ Consider consolidating public safety radio training and user documentation functions under PSCD

Agency Objectives and Options

Objectives/Projects

10 Year Objectives

- Have a defined cycle and sustainable funding source for the refresh and upgrade of all radio assets within the Department

5 Year Objectives

- All institution systems will be completely replaced/upgraded
- Statewide Transportation units will be operating on an implemented radio solution
 1. Augment CMARS to meet Department needs
 2. Share with another aligned agency with appropriate coverage and dispatch services
 3. Join Statewide shared system, if developed

2-3 Year Tactical Projects

- Begin replacement of institution systems and complete the replacement of half of the institution systems
- Refresh the current radio equipment for Parole, OCS and IA divisions with multi-band radios and increase the quantity of radios for these divisions to accommodate all of their radio users
- Establish centralized authority for radio equipment and process decisions
- Establish consistent program for Memorandums of Understanding (MOUs) and Frequency Use Agreements (FUAs) with allied local entities, with assistance from the OCIO if needed

Potential Solutions/Objectives

1: Augment CMARS to meet Department needs

- PSCD is unsure what upgrades would need to be made to upgrade system to the requirements of CDCR and other interested agencies
- Would require loading, coverage and cost studies to fully understand design requirements and implications

Pros	Cons
<ul style="list-style-type: none">■ Would not require significant business retooling as option is an extension of current processes■ Could leverage existing system(s) effectively■ Would increase existing functionality, coverage, bandwidth■ Other agencies may be willing to join system	<ul style="list-style-type: none">■ Would likely require a significant investment to reach Department's requirements■ Would propagate the "stovepipe" system approach■ Option would likely outprice other CMARS users
Risks	
<ul style="list-style-type: none">■ Since augmentation is an expansion to another Statewide system, the Department or the State may not approve the significant funding required	

Potential Solutions/Objectives

2: Share with another agency with appropriate coverage and dispatch services

- Would require loading, coverage and cost studies to fully understand design requirements and implications
- Caltrans and CHP would be good candidates for this solution as they most closely match the coverage and dispatch services needs of the Department

Pros	Cons
<ul style="list-style-type: none">■ Would leverage existing State assets instead of developing a new solution■ Would be a low cost solution■ Matches the State strategic direction■ May not require a significant investment in new end-user equipment	<ul style="list-style-type: none">■ CDCR would need to align business processes with host agency
Risks	
<ul style="list-style-type: none">■ Requires agreement between the two agencies on usage, funding, channel loading, etc.■ Host system may require additional frequencies to adequately support incremental agencies	

Potential Solutions/Objectives

3: Join Statewide shared system, if developed

- Use the DFG system as a base to start a interconnected trunked P25 Phase 2 system that can be used by multiple State agencies
- Utilize pieces/sites of other agencies' systems as available to avoid green-field construction
- Increase coverage to "Statewide"
- Upgrade to trunking to allow separation of traffic for different agencies/workgroups
- Leverage increased functionality and interoperability of trunking and digital operation
- Would require loading, coverage and cost studies to fully understand design requirements and implications

Pros	Cons
<ul style="list-style-type: none">■ Could leverage existing system(s) effectively■ Would increase existing functionality, coverage, bandwidth■ Would leverage funding and political power of multiple agencies■ Would make more efficient use of existing spectrum■ Any additional spectrum dedicated to system would likely decrease channel loading	<ul style="list-style-type: none">■ Will require significant investment to build-out system■ Would require alignment with other agencies' needs■ Control of system would likely be partially or fully removed from DFG■ May require dispatch operations retooling
Risks	
<ul style="list-style-type: none">■ Option would require agreement between agencies on funding, governance, priorities, etc.	

Options Analysis

	Option	Cost to Agency	Fills Agency Gaps	Time to Realization	Implem. Risk*	Oper. Risk*	Alignment with State Objectives
1	Expand current system	High	3	5-10 Years	High	Medium	Low
2	Merge with CSP and expand	Low	4	2-3 Years	Medium	Medium	Medium
3	Share with other agencies	Low	2	2-3 Years	Low	Medium	Medium
4	Build out system to a State shared trunked system	Medium	5	10 Years	High	Low	High

Solution-Gap Rating

- 5 – Fills all gaps with ideal solution and provides additional benefits
- 4 – Fills all gaps with appropriate solutions
- 3 – Fills most gaps with acceptable solutions, some with temporary solutions
- 2 – Fills some gaps, or fills most gaps with temporary solutions
- 1 – Opens more gaps than it fills

* Implem. = Implementation; Oper. = Operational

Next Steps

Next Steps

- Gartner will deliver the Draft Agency Objectives and Roadmap document within five days of this meeting

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EDMUND G. BROWN JR.
GOVERNOR

MARK S. GHILARDUCCI
DIRECTOR



August 14, 2017

Secretary Scott Kernan
California Department of Corrections and Rehabilitation
1515 S Street
Sacramento, CA 95814

Subject: Support for Radio System Update

Dear Secretary Kernan:

The California Governor's Office of Emergency Services (CalOES) is supportive of the California Department of Corrections and Rehabilitation's (CDCR) proposed efforts to update CDCR's aging radio system.

There are several reasons why we support this proposal. CDCR continues to replace antiquated radio equipment with modern Project 25 trunked radio system technology. These efforts will replace outdated radio equipment at additional institutions to ensure Project 25 compatibility and increase reliability. Project 25 is a suite of digital radio communications standards intended to enable interoperable communication among federal, State, and local public safety organizations. Additionally, CDCR's Project 25 trunked radio system has the potential for leveraging as part of a statewide effort to improve interoperable public safety communications. Finally, CDCR's radio system has components beyond their lifecycle, and with parts becoming increasingly difficult to obtain, reliability is difficult to ensure.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark S. Ghilarducci', with a long, sweeping horizontal line extending to the right.

MARK S. GHILARDUCCI
Director



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www.CalOES.ca.gov

CDCR Major Radio System Failures
(CDCR call outs to PSC Technicians)

6/1/2009 - 6/18/2012

LOCATION	# OF FAILURES
Chino CIW/CIM	13
California Mens Colony SLO	2
Calipatria State Prison	25
Chowchilla CCWF & VSPW	3
Chuckwalla State Prison	3
Corcoran	3
Delano KVSP/NKSP	3
Folsom State Prison	2
Ironwood State Prison	2
Lancaster State Prison LAC	8
Mule Creek State Prison	3
Norco CRC	2
Northern CA Youth Center	1
Norwalk Youth Facility	3
Pelican Bay State Prison	2
Richard J Donovan Facility	2
San Quentin State Prison	3
Stockton NCYCC	2
Susanville HDSP/CCC	1
Ventura Youth Correctional Facility	3
	86

Table 1

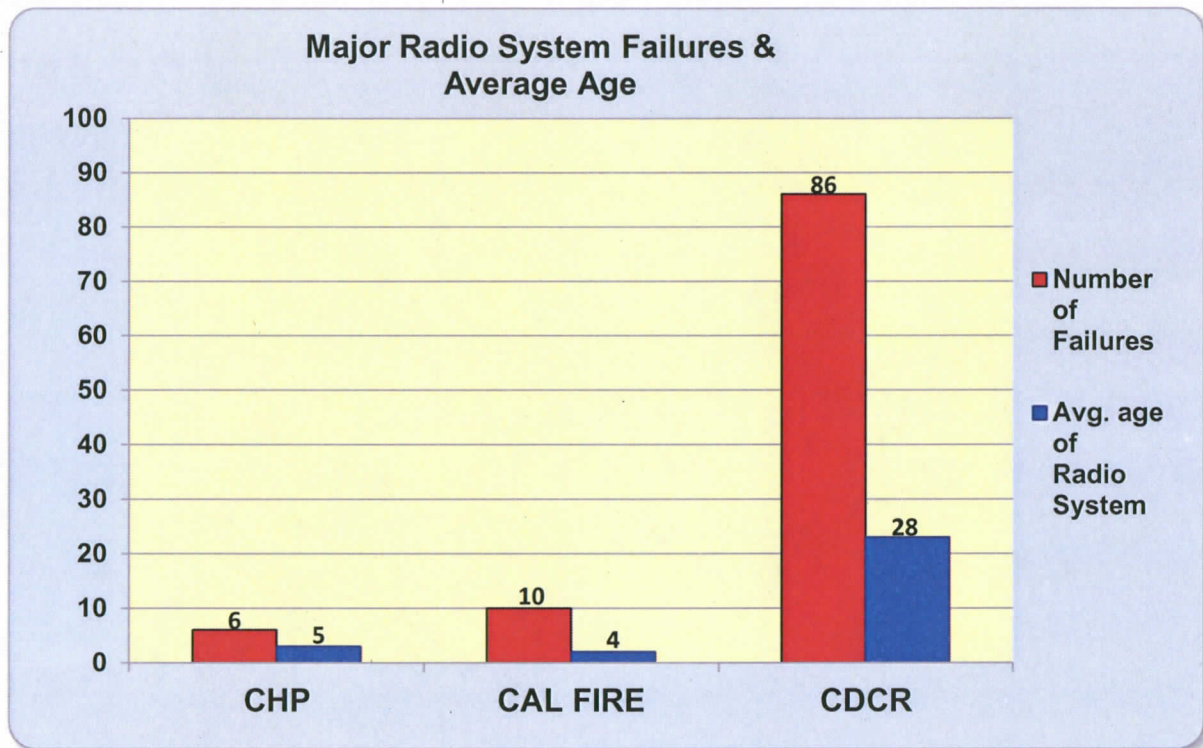


Figure 1: Number of major radio system failures and average age by large scale public safety agencies. The number of major failures is an average from 6/1/2009 - 6/18/2012.

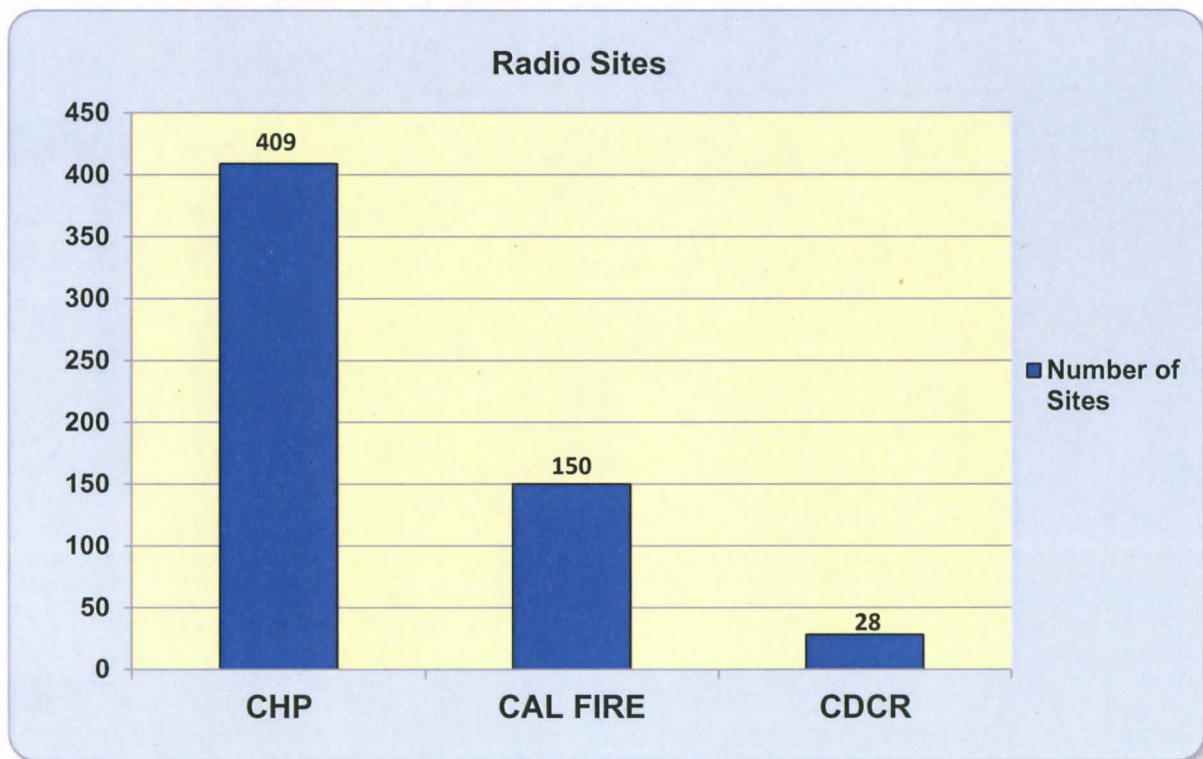


Figure 2: Number of Radio Sites per Agency.

Radio System Comparison

	Radio Coverage Redundancy	Manufacturer Support	Parts Availability	Impact	Interoperability	Surveyed
CHP						
Base Station	Yes	Yes	Yes	Low	Yes	N/A
Mobile	Yes	Yes	Yes	Low	Yes	N/A
Portable	Yes	Yes	Yes	Low	Yes	0
CALFire						
Base Station	Majority	Yes	Yes	Moderate-Severe	Yes	N/A
Mobile	Yes	Yes	Yes	Low	Yes	N/A
Portable	Yes	Yes	Yes	Moderate	Yes	0
CDCR						
Base Station	No	No	No	Severe	No	N/A
Mobile	No	No	No	Severe	No	N/A
Portable	No	No	No	Severe	No	410

Table 1: Large agencies radio system comparison